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TECHNICAL MANUAL

RAILWAY SHOP BATTALION



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WAR DEPARTMENT,
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RAILWAY SHOP BATTALION

Prepared under direction of the
Chief of Engineers

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SECTION I

GENERAL

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1. **Purpose and scope.**—*a.* This manual explains the organization and operation of the railway shop battalion for employment on a standard military railway. Its purpose is to assist railway shop battalion officers in the training and operation of their units, and to

guide command and staff officers charged with the employment of railway shop battalions.

b. Since actual conditions which confront a railway shop battalion may vary widely, it is not intended that a literal interpretation of these provisions be made. They should be considered as a guide and exceptions thereto made in the interest of efficient operation and greater utility.

c. The statement of duties is only for the purpose of showing the command relations between various individuals and command responsibility, and to explain Tables of Organization. Rules and regulations covering details of shop operations are not within the scope of this manual.

2. Mission.—The mission of a railway shop battalion is to—

a. Accomplish repairs to existing or U. S. Army standard equipment beyond the capacity of the railway operating battalion.

b. Stock and furnish to the railway operating battalions finished and semifinished parts as nearly prepared for application as consistent in order to eliminate delays and facilitate repairs by that battalion to the maximum possible degree.

c. Repair railway work equipment not permanently assigned to operating battalions which is in need of repairs beyond their capacity to accomplish.

d. Repair railway equipment assigned to the Coast Artillery Corps or other arms or services.

e. Repair equipment beyond the capacity of other repair organizations as may be directed by higher authority.

3. Organization.—*a.* The railway shop battalion is organized so as to form a balanced unit for the repair of railway equipment. Each battalion includes the personnel necessary to operate a shop and equipment for the erection and repair of railway locomotives, cars, work equipment, etc. It is the basic unit for railway shop operations and may be expanded for the operation of shops beyond the capacity of the original organization. The type of railway equipment in use and actual operations performed by the battalion may require modifications of the organizations shown.

b. The personnel for purposes of organization, administration, and control is grouped into a headquarters, headquarters and service company, medical detachment, erecting and machine shop company, boiler and smith shop company, and car repair company. For details of organization, see Tables of Organization Nos. 5-145, 5-146, 5-147, 5-148, and 5-149. (See fig. 1.)

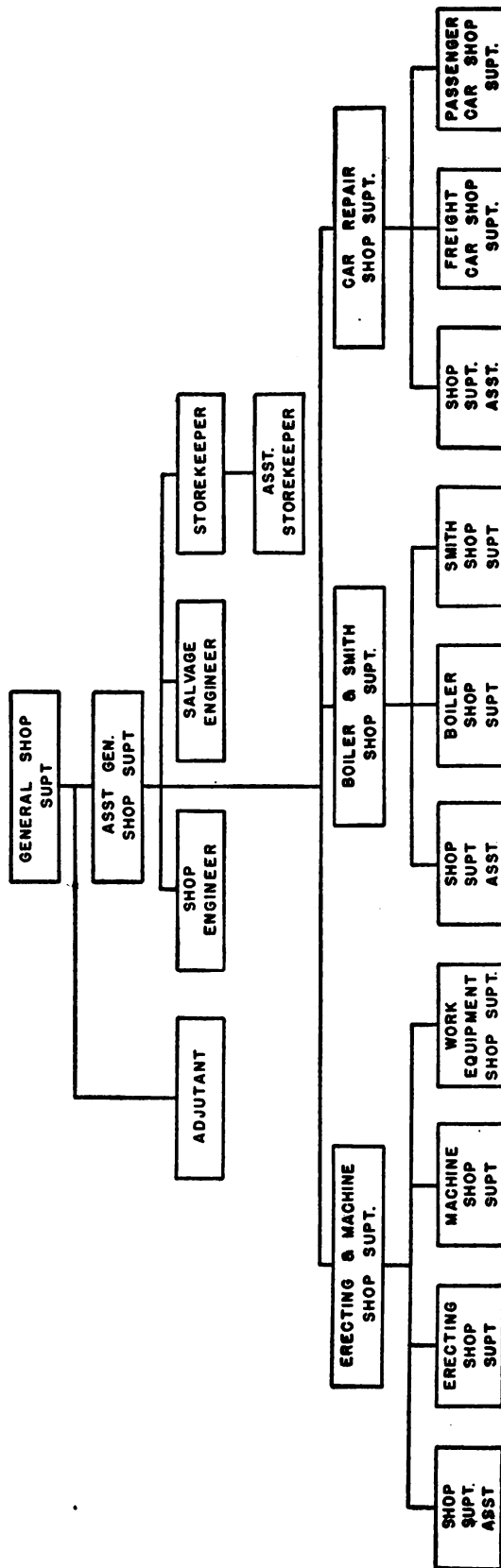


FIGURE 1.—Command relations, railway shop battalion.

4. Equipment.—*a. Regular.*—Details of equipment issued to the railway shop battalion are published in Tables of Basic Allowances. This equipment is issued on mobilization for the military administration and training of the unit.

b. Special.—(1) The special equipment of the railway shop battalion consists of the tools and facilities of a railway repair shop and includes repair and manufacturing equipment which is impracticable to install in railway operating battalion shops. A railway shop battalion may be required to operate an existing shop and issued such additional equipment as may be required, or it may be required to install new equipment and develop necessary facilities. Such equipment will be issued to the battalion in the theater of operations. Fixed equipment requiring extensive construction work such as drop tables for removing wheels and trucks, and overhead cranes and mono-rails is desirable for locomotive work but may not be available, except in an existing installation. Car portable hoists are preferable for removing wheels and trucks, and industrial tractors, trucks, and portable cranes are preferable to overhead or fixed cranes. Emphasis is laid on flexibility, ease of expansion, and elimination of special construction work.

(2) Headquarters, and headquarters and service company equipment includes—

(*a*) *Administrative.*—Office, drafting and reproduction, and library.

(*b*) *Supply.*—Office and material handling equipment.

(*c*) *Plant maintenance.*—Power plant, generator sets, air compressors, phase converter, switchboards and distribution apparatus; office equipment; carpenters', electricians', masons', pipe fitting and plumbing tools, and welding equipment; riggers', millwrights', and fire-extinguishing equipment. The power required may be estimated from the number of locomotive repairs completed. Requirements per locomotive repair completed monthly are approximately—

1. *Electricity.*—25-kilowatt generator capacity, exclusive of air compressors.

2. *Compressed air.*—125 cubic feet per minute capacity.

3. *Steam.*—8 horsepower for pumps, steam hammer, and miscellaneous service lines and exclusive of electric power, compressed air, and building heat. Steam requirements for heating will vary with building design and climatic conditions.

(*d*) *Reclamation.*—Office equipment; mechanics', machinists' and blacksmith tools; gas and electric welding equipment; gages; bull-

dozer, forges, power hammers; grinders, lathe, threading machinery, upright and radial drills; jacks and material handling equipment; air hose mounting and stripping machinery; cleaning vats, waste sorting screen, soaking and settling tanks, storage tanks, and centrifuge.

(3) Erecting and machine shop company equipment includes—

(a) *Headquarters*.—Office and material handling equipment.

(b) *Erecting shop*.—Mechanics' tools, grinders, portable lathe, upright and sensitive drills, jacks and material handling equipment, boiler washer, filler and tester, cleaning vats, sandblasting, brush and spray paint equipment.

(c) *Machine shop*.—Portable pneumatic and electric tools, boring bars, cylinder facers, and crankpin turners; radial, upright, and sensitive drills; engine, chucking and bar turret lathes, and wheel lathe; cylindrical, combination, dry, wet, radial, surface, swing, tool, and universal grinders; buffers; horizontal and vertical boring mills; horizontal, vertical, and universal millers; planers; shapers; slotters; nut-tapping and bolt-threading machinery; metal cutting saws; arbor and hydraulic vertical and wheel presses; air brake test rack, air-pump cylinder grinder, cock grinder, and other air brake repair equipment; equipment for repair of feed water pumps, injectors, and other specialties.

(d) *Work equipment platoon*.—Office equipment, mechanics' tools, automotive tools and equipment, jacks, boilermakers' tools and boiler-maker test apparatus, drills, grinders, shaper, engine lathe, welding, and material handling equipment.

(4) Boiler and smith shop company equipment includes—

(a) *Headquarters*.—Office and material handling equipment.

(b) *Boiler shop*.—Boiler makers' tools; pneumatic flanging press, flanging clamps and blocks, flanging forge; bending rolls; nibbler, punches, and shears; upright and multiple spindle drills; rivet heaters; pneumatic riveters; grinders; tube furnace, cutters, swaging and expanding machinery, gages and apparatus for repair of superheater units; tube test rack and pump, boiler test apparatus; gas and electric welding equipment; jacks and material handling equipment.

(c) *Smith shop*.—Blacksmith tools, anvils, forges, blowers, power and steam hammers; forging machines, bulldozer; bar shears and spring-making machinery; heat-treating, spring-tempering and tool furnaces; pipe fitting tools; pipe bending and threading machinery; sheet metal machinery; melting furnace, core, oven, flasks, rod straightener and molding equipment; babbitting and brazing fur-

naces; buffer, bench and engine lathes, hand miller, arbor press, brazing and soldering equipment, electricians' tools, and special equipment for repair of turbo generators, batteries, and other electrical apparatus.

(5) Car shop equipment includes—

(a) *Headquarters*.—Office and material handling equipment.

(b) *Car repair*.—Mechanics' tools; jacks, shop trucks, and material handling equipment; gas welding and cutting equipment; pipe fitting tools.

(c) *Passenger equipment*.—Woodborer, jointer, molder, mortiser, planer, sander; band, rip, resaw, and scroll saws; circular cut-off and variety saws; pattern makers' lathe and trimmer; carpenters' and cabinetmakers' tools; sewing machines and canvas working equipment; mechanics' tools; jacks and material handling equipment; sandblasting, brush and spray painting equipment; car wheel borer; car wheel lathe; buffers; radial, sensitive, and upright drills; grinders; and arbor, vertical, and wheel hydraulic presses.

c. *Weapons*.—For its own protection and for guard, personnel of the battalion are armed with the pistol or revolver.

d. *Transportation*.—(1) The railway shop battalion is not mobile and no provision is made for transportation other than that necessary for supplying the unit during mobilization, for distribution of supplies within the unit, and for contact with higher authority and other units. Movement of a railway shop battalion requiring transfer of equipment is made by rail.

(2) Tables of Organization show the authorized allowance of motor transport.

(3) The railway shop battalion is not provided with riding horses or animal-drawn transportation.

5. Military employment.—a. The general organization of a military railway system as applied to an extensive theater of operations is described in TM 5-400 and FM 5-5. The basic unit is the railway operating battalion (see TM 5-405) which operates and maintains one railway division. When two or more operating battalions are required, they are grouped geographically into railway grand divisions, each normally controlling two to six operating battalions. When grand divisions are operated as part of a system, they are controlled by the manager, Military Railway Service, who is under the engineer on the staff of the commanding general, communications zone.

b. A railway shop battalion is assigned to a railway grand division when the grand division is operated independently. When grand

divisions are operated as part of a railway system, a shop battalion may be assigned to a grand division or may be retained under the direct control of the manager, Military Railway Service. When conditions are such as to permit uniform operation and permanent assignment of power and other equipment to a grand division as in civil practice, assignment of a shop battalion to a grand division is desirable to keep responsibility for the repair of its equipment within the grand division. Necessity for greater flexibility in operation and frequent transfer of equipment from one grand division to another to combat the ever prevalent shortage normally makes it more desirable to retain railway shop battalions under the control of the manager, Military Railway Service.

c. The number of railway shop battalions is determined by conditions of equipment, whether it is United States standard military or available civil equipment, severity of the service, and shop facilities available. Work capacity of the battalion (see par. 9) is approximately sufficient to accomplish its mission for each 100,000 troops in the field. Expansion of work capacity of the battalion is affected by increasing personnel (as circumstances require) up to approximately double the capacity provided by present Tables of Organization (see T/O 5-145). Beyond that capacity, additional battalions will be needed. If large shop facilities are available, a regimental organization will be established.

6. Relation to other arms and services.—The railway shop battalion is organized and equipped primarily for repair of standard military railway equipment operated by the Military Railway Service. Its use for other purposes reduces railway operating efficiency by increasing quantity of bad equipment. The railway shop battalion has capacity to repair heavier equipment than any other repair unit, and the repair of such equipment as outlined in paragraph 2 will therefore devolve upon it. Operations other than those regularly assigned to the battalion are arranged for with the manager, Military Railway Service, or with the general superintendent of a grand division in the case of an independent grand division, through the engineer, communications zone. The commander of a railway shop battalion will however cooperate with other organizations to effect the dispatch of emergency repairs.

7. Combat.—Railway shop battalions are not intended for use in combat. Personnel are nearly all specialists, highly skilled in their respective trades. Shop battalions are located as far as practicable from combat areas to avoid interference with the operations. Enemy interference may occur by aerial bombardment and when this is

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expected, the area should be protected by troops and weapons from the arms.

SECTION II

TECHNICAL OPERATIONS

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8. Initial.—Extensive repairs to existing railway equipment in the theater of operations are not contemplated but probably will have to be accomplished until sufficient standard military equipment can be put in service to relieve existing equipment. Initial operations therefore involve both heavy repairs to existing equipment and assembly and placing in operation of such standard military equipment as may from time to time be provided.

9. Routine.—*a.* Routine operations of the railway shop battalion are classified repairs to existing or standard military railway motive power, heavy repairs to existing or standard military railway cars, repair of subassemblies, and manufacture of parts for railway operating battalions.

(1) *Classified repairs to locomotives* are defined as those which add definite periods to the life of equipment in distinction to running repairs which include only that work necessary to keep equipment in operating condition. The five classes of repairs to steam locomotives are—

(*a*) *Class 1.*—Rebuilding locomotives, including complete new boiler or new back end, new flues and tubes, general repairs to machinery and tender, including tires turned or changed, journals turned, driving boxes and rods overhauled, and all bearings refitted.

(*b*) *Class 2.*—New firebox or one or more boiler shell courses or roof sheets, new flues and tubes, and general repairs to machinery and tender.

(*c*) *Class 3.*—Repairs to firebox and boiler, new tubes, and general repairs to machinery and tender. Class 3 repairs are normally required after 4 or 5 years' service.

(*d*) *Class 4.*—Light repairs to firebox and boiler, part or full set of tubes, and necessary repairs to machinery and tender, including returning tires and refitting driving axle bearings. Class 4 repairs are normally required after 2 years' service.

(*e*) *Class 5.*—Necessary repairs to boiler and tender, including returning tires and refitting driving axle bearings. Class 5 repairs are normally required after 1 year's service.

Class 1 and 2 repairs should not be attempted ordinarily in the theater of operations. Class 3, 4, and 5 repairs normally are undertaken by railway shop battalions. The battalion has a capacity to complete about one-half classified locomotive repairs daily, in addition to fulfilling requirements to other equipment, machining and assembly of subassemblies and finished and semifinished material.

(2) *Heavy car repairs* are less clearly defined as those involving over 40 man-hours' work per car; actually, heavy car repairs usually involve repairing and rebuilding cars, replacing all worn parts with new or rehabilitated parts for a definite extension of life. Capacity of the battalion for standard railway car repairs varies with the type and age of such equipment. The battalion should be able to repair 4 to 16 freight cars daily, the smaller figure being for the heavier repairs.

(3) *Repair of subassemblies* normally includes all air brake operating equipment, feed water pumps and injectors, generators, gages, cocks and valves, springs, etc. Such repairs are preferably accomplished by the shop battalion which is provided with special repair and test facilities, and is better organized for production work than railway operating battalions. Complete spare assemblies are furnished to operating battalions to replace defective assemblies.

(4) *Parts manufactured* by the railway shop battalion normally include replacement parts not available from depots and finished or semifinished material which is deemed advisable to be furnished to operating battalions as nearly ready for application as conditions permit. The later parts include pistons and cross heads, motion work parts, main and side rods, rod bushings, driving tires, boxes, bolts, springs, brake rigging pins, wheels (including engine truck trailer, tender car) air brake materials, injectors, water pumps, head light generators, batteries, flues, arch tubes, safety appliances, standard steel patches, bolsters, side frames, draft and draw gear parts, and many other similar items.

b. Repair of railway equipment is required by normal wear, accident, or neglect.

(1) *Normal wear*.—Normal wear is the cause of most repair operations and should be corrected before failures occur, equipment being routed to the shop while still performing useful work. Observance of this principle is much more important in connection with railway equipment than with highway transport equipment. Failure of highway transport equipment in service affects only the failed equipment and its load whereas failure of railway equipment delays the train transporting several hundred tons of supplies, blocks traffic on the

entire line, and requires additional train movements to deadhead the damaged equipment to the shop. Assignment of motive power for repair is accomplished in civil practice on a mileage basis, an accurate record of each locomotive being maintained. Accurate mileage records may not be available in military railway operations, but proper use of inspection reports provides an accurate determination for the need of classified repairs. Cars needing heavy repairs are usually routed to the shops with restricted load or empty. A preferred practice is to route groups of cars of one age and design to the shops thus permitting establishment of a production line and more economical shop operations. This method maintains cars in much better condition than by sending individual cars to the shop when required by excessive wear or failure.

(2) *Accidents*.—Repair because of accidents should be considered in respect to availability of new equipment. Manpower and material required to place a piece of new equipment in the theater of operations normally are much less than that required for maintenance of complete stocks of spare parts and rebuilding that equipment in the theater of operations. In the case of badly damaged equipment, it normally is preferable to strip it for spare parts rather than to rebuild it. It can be expected that 4 cars per 10,000 cars in service will be damaged daily in accidents.

(3) *Neglect*.—Repair because of neglect may be confined to replacement of wearing parts or may involve extensive damage to parts not readily replaced such as damage to boilers caused by low or bad water and neglect of boiler wash-outs. In case of extensive damage procedure governing repair because of accidents will be followed. Inspection reports will place responsibility for neglect, and severe disciplinary measures used to combat it.

10. Minor.—Minor operations are repair to cranes, maintenance of way machinery, rail cars and miscellaneous railway equipment, railway equipment issued to other arms and services, salvage of railway materials, and miscellaneous work assigned to the battalion. Miscellaneous equipment assigned to the battalion for repair requires many operations not conducive to a smooth-running shop and such operations will be kept apart from routine operations of the battalion as much as possible.

SECTION III

HEADQUARTERS, AND HEADQUARTERS AND SERVICE COMPANY

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11. Organization (fig. 2).—*a.* Battalion headquarters consists of the battalion commander and his staff.

b. Headquarters and service company consists of company headquarters and six sections, administration, shop superintendent, plant maintenance, reclamation, supply and transportation, and stores (see T/O 5-146).

12. Function.—The function of the headquarters, and headquarters and service company is to provide in one organization technical, administrative, and supply personnel necessary to enable the battalion commander to supervise activities of the battalion and operate certain activities common to all companies. Primary duties of the headquarters and service company are to provide—

a. Military administration of the company and battalion.

b. Company and battalion supply and operation of company motor vehicles.

c. Technical administration of the battalion; determine priorities, routing of work through shops, coordinate operations and material requirements, and maintain necessary records.

d. Maintenance of shops, facilities, and machinery, operate power plant and power distribution.

e. Reclamation or otherwise dispose of all material turned in for salvage.

13. Battalion headquarters.—*a.* The lieutenant colonel commanding the battalion is general superintendent of the shops and facilities assigned to his battalion. He is responsible for training, discipline, messing, housing, and morale of his troops. He makes such reports and keeps such records as may be necessary for efficient operation of shops, facilities, and personnel, and as may be required by higher authority. As shop superintendent, he is responsible for

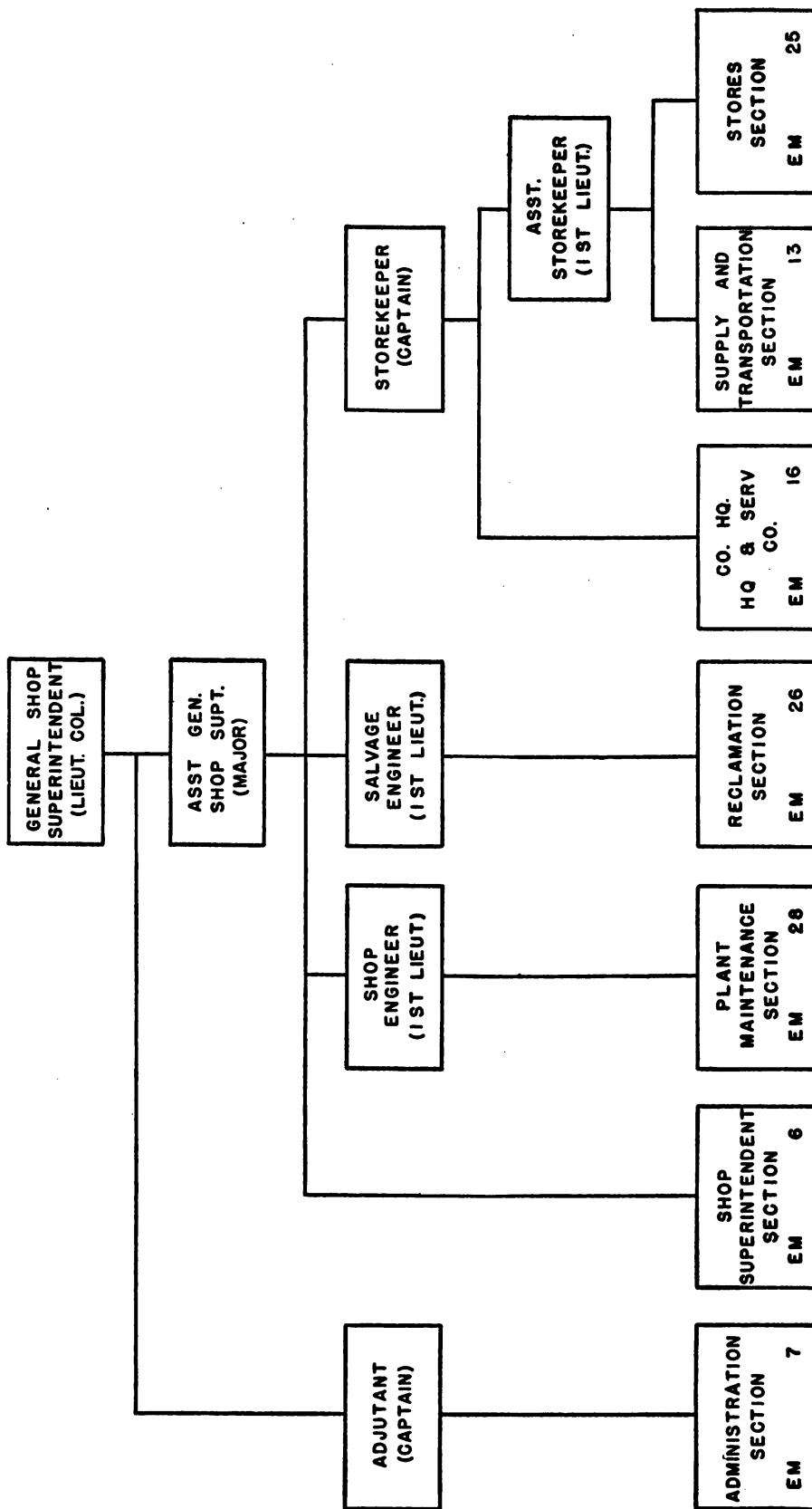


FIGURE 2.—Organization, headquarters, and headquarters and service company, railway shop battalion.

the technical operations of the battalion, for management and coordination of all units, and efficient use of personnel and equipment. He determines methods for assembly and repair of railway equipment and arranges for procurement of necessary facilities and supplies. He adjusts arrangement of personnel and arranges for procurement of additional personnel if required. He should be familiar with operating conditions of the railway grand division or system to which his battalion is attached and be prepared to make recommendations for systematic repair of equipment. He exercises control through his company commanders.

b. Assistant general shop superintendent, major, is executive officer of the battalion, and is second in command. He makes the necessary decisions supplementary to the basic decisions of the battalion commander who gives the necessary instructions to operating companies. He directs the work of the shop superintendent's section.

c. Battalion adjutant, captain, is in direct charge of the administration section of the headquarters and service company. He is responsible for the military administration of the battalion and handles matters relating to personnel, battalion orders, records, guard, mail, and messenger service. He advises the battalion commander on all matters relating to military training and military employment of the battalion.

14. Company headquarters.—This unit takes care of the administration and supply of the company.

a. The captain commanding the company is battalion and company supply officer and storekeeper. As supply officer he maintains the supply of food, clothing, ammunition, and equipment. As storekeeper he coordinates the technical supply requirements of the battalion, passes upon requisitions submitted by companies of the battalion, supervises checking of incoming supplies, stores, and material for salvage, and makes issues. He maintains an adequate supply of finished and semifinished materials and manufactured parts and subassemblies, and may be required to maintain a depot under technical supervision of the general storekeeper of a railway grand division or system, and issue technical supplies and finished and semifinished materials to the railway operating battalions. He renders such reports and keeps such records as may be required by higher authority or in the interest of efficient operation.

b. A first sergeant is in charge of company administration and may be assigned other duties. He is assisted by a corporal, company clerk.

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c. Sergeants.—(1) Mess sergeant is in charge of the receipt, preparation, and distribution of rations for the company. He maintains the company mess and the mess for battalion officers. He has the cooks and helpers under his direction.

(2) Supply sergeant is in charge of the receipt, care, and issue of company supplies (except technical supplies), including clothing, ammunition, individual and organizational equipment. He is assisted by a private, storekeeper.

(3) Storekeeper sergeant is in charge of the receipt, care, and issue of company technical supplies. He is assisted by a corporal, stock clerk, and privates, storekeepers.

d. Corporals, clerks, reporting to first sergeant and storekeeper sergeant.

e. Privates.—Bugler is company messenger and reports to the first sergeant; cooks and helpers operate the company mess under the mess sergeant; storekeepers are material handlers, one storekeeper reports to supply sergeant and the remaining storekeepers to storekeeper sergeant. Orderlies and basic privates are assigned as needed.

15. Administration section.—This unit takes care of routine battalion administration, pay rolls, morning reports, records, and mail. It reports to the battalion adjutant.

a. Master sergeant, sergeant major, chief clerk for the adjutant, is in charge of section.

b. Staff sergeant, personnel clerk, is in charge of battalion personnel records.

c. Corporal, clerk, is in charge of collection and distribution of mail, and performs other clerical duties as directed.

d. Privates, office clerk and stenographer, report to the sergeant major.

16. Shop superintendent's section.—This unit takes care of technical administration of the battalion. It maintains records necessary to determine status of work in the shop, shop capacities, scheduling of operations, and coordination of activities of the companies. It provides personnel for shop lay-out and development of facilities. It reports to the assistant general shop superintendent.

a. Master sergeants.—(1) Chief clerk supervises rendition of reports on shop operations and keeps records and data for technical operation of the battalion. He exercises technical supervision over all shop clerks.

(2) Draftsman, mechanical, performs design and drafting for the battalion. He is assisted by a private, draftsman.

b. Staff sergeant, shop dispatcher, coordinates all technical operations of the battalion by means of a shop schedule and routing system.

He prepares a master sheet containing dates of completion of the major items of repair work so timed that there is a constant flow of finished materials to the erecting shops in the order required for assembly. He prepares work and material estimates. A detailed knowledge of time and materials required for shop operations is required as there will be little opportunity for time studies on such operations. He is assisted by privates, production clerks.

c. Privates.—Draftsman, mechanical, reports to master sergeant draftsman; production clerks prepare work orders, material requisitions and charts in connection with work planning, and report to the shop dispatcher.

17. Plant maintenance section.—This unit operates the power plant, air compressors, pumps, etc., and maintains piping and wiring for distribution. It provides water, light, and heat, and maintains all shop buildings, equipment, machinery, and facilities.

a. First lieutenant, shop engineer, is in charge of the section. He is responsible for the maintenance of all buildings and facilities and operation of all facilities used by two or more companies. He arranges for suitable and adequate supply of fuel, lubricants, etc., for shop use. He prepares rules and regulations for operation of machinery, etc., for safety, and fire prevention.

b. Master sergeant, assistant shop engineer, carries out orders of shop engineer and directs work of section.

c. Technical sergeant, engineman, stationary, steam, is in charge of power plant, generator sets, air compressors, etc. He is assisted by privates, generator and switchboard tenders, and privates, firemen.

d. Staff sergeant, plant electrician, is in charge of operation and maintenance of all installed electrical apparatus. He cooperates with power operating engineer in operation of power plant, and is assisted by a corporal, plant electrician, and privates, electricians.

e. Corporals.—(1) Plant electrician is assistant to staff sergeant, plant electrician.

(2) Labor foreman is in charge of labor squad; he reports to assistant shop engineer.

(3) Pipe fitter foreman is in charge of pipe fitting, plumbing, and heating; he reports to the assistant shop engineer.

f. Privates.—Clerk maintains the records of the section; carpenter and bricklayer work on building maintenance as required; the bricklayer also maintains boiler settings under the direction of the power operating engineer, and shop furnaces under the direction of the furnaceman in the smith shop platoon of the boiler and smith shop

company; electricians maintain all shop motors, generators, control, wiring, and electrical apparatus, and report to the plant electrician; generator and switchboard tenders operate power plant machinery; firemen operate boilers and report to the engineman; pipe fitters and plumbers maintain all steam, water, and air piping, heating apparatus and sanitary piping fixtures, and report to the pipe fitter foreman; welder and basic (laborers) are assigned as required; laborers report to labor foreman.

18. Reclamation section.—This unit reclaims or otherwise disposes of all scrap material. This material comes from the shop battalion and from the operating battalions, and is usually that released from scrapping of locomotives, cars, and other equipment, track and signal material unsuitable for use in its present condition, broken and damaged machine parts which cannot be conveniently restored by regular shop operations, used oil and journal box packing. Reclamation work consists of reconditioning and reforming this material, after which it is turned in to stock. Scrap should be sorted on receipt but reclamation operations are controlled by demand for material. The scrap plant normally consists of an inbound and outbound track, 80 to 100 feet apart, with the area between used for unloading, sorting, handling, and dismantling retired equipment, cutting, burning, and reloading scrap material. Crane and trucking runways are provided served by a crane of 5- to 15-ton capacity equipped with a boom of sufficient length to handle materials from the runways. The reclamation plant is normally located adjacent to the scrap plant. Oil and journal box packing reclamation plant is not necessarily adjacent to or part of the general reclamation plant, but is operated by this unit. This material is received from the operating battalions in containers, cleaned by hand picking, washed, and centrifuged, oil soaked, and replaced in service. Oil is filtered, treated for acidity, and settled. Short ends of waste and oil sludge are used for fire building. The reclamation section works in collaboration with the battalion storekeeper.

a. First lieutenant, salvage engineer, is in charge of scrap yard and reclamation plant. He determines through the battalion storekeeper the demand or anticipated consumption of the various materials and regulates operations of the section accordingly.

b. Technical sergeant, salvage engineer assistant, carries out orders of the salvage engineer, and directs the work of the section.

c. Corporals.—(1) Blacksmith is in charge of reclamation of bar stock and related work. He is assisted by privates, blacksmiths.

(2) Mechanic foreman is in charge of dismantling of assemblies, reclamation of machined stock, and related work. He is assisted by privates, machinists, and machine operators.

(3) Labor foreman is in charge of reclamation of oil and packing. He is assisted by basic privates (laborers).

(4) Salvageman is in charge of sorting scrap. He is assisted by privates, salvagemen, and laborers.

d. Privates.—Blacksmiths report to corporal blacksmith; salvagemen report to corporal salvageman; machinists and screw machine operators report to mechanic foreman; oil and packing salvage operators (laborers) report to labor foreman; welders, employed on cutting scrap, report to assistant salvage engineer, and are assigned as required; basic privates (laborers) report as directed.

19. Supply and transportation section.—This unit takes care of battalion supplies (except technical supplies) and provides personnel for operation of motor vehicles of the headquarters and service company. It reports to the assistant storekeeper. Technical sergeant, battalion supply sergeant, is in charge of battalion supplies (except technical supplies), including clothing, ammunition, individual and organizational equipment. He is in charge of motor vehicles of the headquarters and service company, and is assisted by the motor corporal and privates, chauffeurs, motorcyclist, and storekeepers.

20. Stores section.—The function of this section is three-fold. First, provides for procurement and stocking of raw materials, manufactured assemblies and subassemblies, finished and semifinished materials, tools and equipment necessary for operation of the shop; second, determines demand and arranges for procurement of finished and semifinished materials to be furnished operating battalions; finally, coordinates through its stock records production of various materials which either may be produced by the reclamation section or otherwise provided.

a. First lieutenant, assistant battalion storekeeper, is in charge of section. He confers with and reports to the company commander in all matters pertaining to the function of section.

b. Technical sergeant, battalion storekeeper sergeant, is in charge of battalion technical supplies. He is assisted by corporals, stock clerks, and privates, storekeepers.

c. Staff sergeant, stock clerk, is chief clerk to the storekeeper and assists storekeeper in administration of section.

d. Corporals, stock clerks, are assistants to battalion storekeeper sergeant.

e. Privates, storekeepers, report to battalion storekeeper sergeant.

SECTION IV

ERECTING AND MACHINE SHOP COMPANY

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Company headquarters.....	23
Erecting shop platoon.....	24
Machine shop platoon.....	25
Work equipment platoon.....	26

21. Organization (fig. 3).—Erecting and machine shop company is composed of company headquarters, erecting shop platoon, machine shop platoon, and work equipment platoon (see T/O 5-147).

22. Function.—Erecting and machine shop company strips railway locomotives assigned to the battalion for repair, performs machine operations and fitting on parts and subassemblies, cleans and repairs locomotive air brake equipment, performs autogenous welding operations, and erects and places repaired locomotives in service. It maintains all portable tools and provides switching service for the battalion.

23. Company headquarters.—This unit takes care of the administration and supply of the company.

a. Captain, company commander and shop superintendent, is responsible to the battalion commander for the operation of his company and for accomplishment of work scheduled. He is responsible for administration of his company, for distribution of his personnel, for maintenance of an adequate supply of materials, and for economical and efficient use of materials and personnel. He keeps such records and makes such reports as may be required by the battalion commander or higher authority, and as may be necessary for efficient operation of his unit.

b. Second lieutenant, shop superintendent assistant, assists the superintendent in the performance of his duties and has direct charge of military administration and supply of the company, and procurement, storage, and issue of technical supplies.

c. First sergeant has immediate charge of all routine work of the company. He prepares or supervises the preparation of routine reports, keeps organization records, prepares and issues orders, and performs such other work as may be assigned to him. He is assisted by a corporal, company clerk.

d. Staff sergeant, shop dispatcher, arranges details of shop operations. He analyzes schedules of work prepared by the headquarters

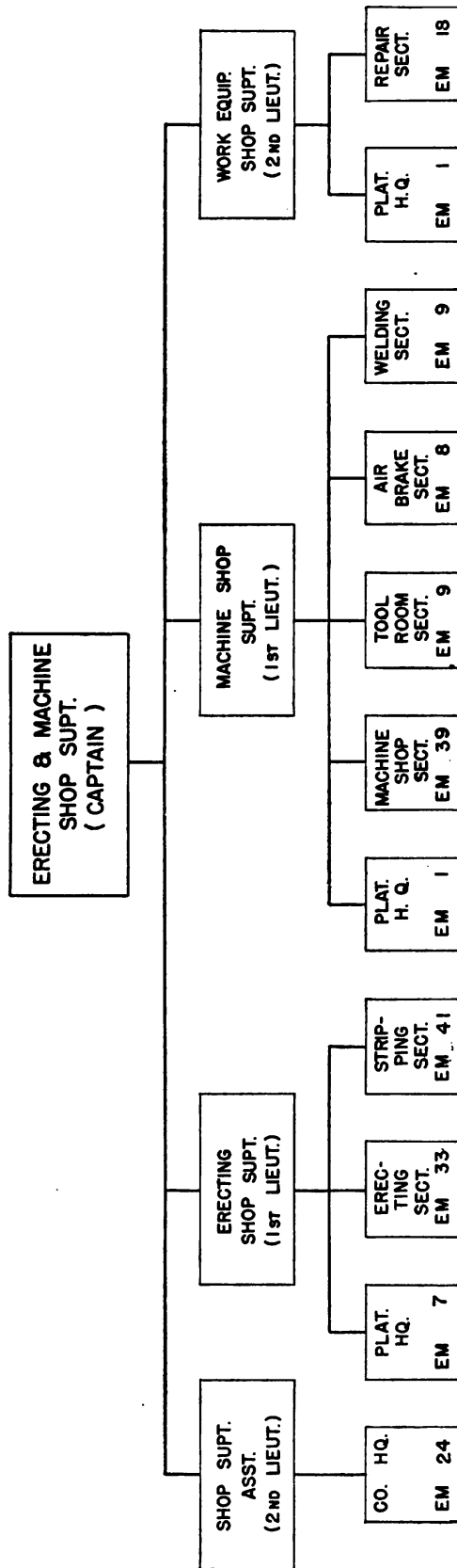


FIGURE 3.—Organization, Company A (erecting and machine shop company), railway shop battalion.

and service company, and issues work and material orders to the platoons. He keeps such records of shop operations as may be required. He is assisted by privates, production clerks.

e. Sergeants.—(1) Mess sergeant operates the company mess, and is assisted by cooks and helpers.

(2) Supply sergeant is in charge of the receipt, care, and issue of company supplies (except technical supplies), including clothing, ammunition, individual and organizational equipment, and company motor vehicles. He is assisted by privates, chauffeurs, and storekeeper.

(3) Storekeeper sergeant is in charge of receipt, care, and issue of such company technical materials (except tools) as is deemed advisable to stock in erecting shop area. This normally includes such small standard items as bolts, nuts, and cotters as are in current use. He is also charged with the responsibility of cooperating with the battalion storekeeper sergeant, keeping him advised of the company's needs for technical material of all kinds, also where and when these materials should be delivered.

f. Corporals, clerks, report to first sergeant and storekeeper sergeant.

g. Privates.—Bugler is company messenger and reports to first sergeant; cooks and helpers report to mess sergeant; production clerks report to shop dispatcher; chauffeurs and storekeeper report to supply sergeant, and one storekeeper reports to storekeeper sergeant. The orderly is assigned as needed.

24. Erecting shop platoon.—This unit receives locomotives assigned to the battalion for repair, removes worn and damaged parts sending these to the machine shop platoon or to the boiler and smith shop company for repair, or to the reclamation section of the headquarters and service company for disposition. On receipt of repaired or new parts, locomotives are assembled and placed in service. Considerable repair operations on boilers and tanks, fitting of forgings and pipe, removal and assembly of electrical appliances, and some machine and welding operations are performed in the erecting shop by personnel of the boiler and smith shop company and machine shop platoon, and there must be cooperation between this platoon and the other units for the efficient handling of the work. This platoon is composed of a headquarters, an erecting section, and a stripping section.

a. Platoon headquarters provides administrative force to coordinate work of the sections, and for inspection.

(1) First lieutenant, platoon commander, is erecting shop superintendent. He has charge of stripping and assembly of locomotives

received for repair; inspection, tests, and delivery of such repaired equipment. He coordinates the work of erecting and stripping sections, adjusts normal assignment of personnel as required, and is responsible for their cooperation with personnel from other units of the battalion.

(2) Technical sergeant, shop superintendent assistant and second in command, is general foreman in charge of the platoon.

(3) *Privates*.—Air brake mechanic assists in inspection and testing air brake equipment, and may be assigned to either section for removal or assembly of air brake equipment; crane hoist operators; hostlers receive locomotives, clean fires, fuel and water locomotives, operate locomotives under test, and turn repaired locomotives over to crews of operating battalions. Crews for breaking in repaired locomotives and doing switching in shop areas are provided by the railway operating battalions and attached to the railway shop battalion, working under direction of erecting and machine shop superintendent.

b. Erecting section.—This section assembles repaired locomotives from parts or subassemblies received from stock, machine shop platoon, and boiler and smith shop company. It performs all painting, and tests and places locomotives in service.

(1) Sergeant, assistant engine house foreman, is erecting foreman in charge of section. He is responsible for proper assembly and test of locomotives and for their delivery to railway operating battalions. He sees that proper materials and parts are received, and arranges his operations in accordance with schedules and work orders prepared by the shop dispatcher. He coordinates the work of personnel from other units in his department with his own force.

(2) Corporals, mechanic foremen, are in charge of working squads.

(3) *Privates*.—Automobile electrician and gas engine mechanics work on gasoline equipment; general painter and sign painter operate under erecting foreman; locomotive mechanics and railway mechanics are formed into working squads under corporal foremen.

c. Stripping section.—This section receives locomotives for repair, removes and cleans locomotive parts scheduled for repair or replacement, and distributes these to the other units of the battalion.

(1) Staff sergeant, assistant engine house foreman, is stripping foreman in charge of the section. He is responsible for the removal and cleaning of parts scheduled for repair and for their distribution in accordance with schedules and work orders prepared by the shop dispatcher. He checks condition of locomotives received.

(2) Sergeant, assistant engine house foreman, is assistant stripping foreman in direct charge of operations of section.

RAILWAY SHOP BATTALION

(3) *Corporals*.—(a) Mechanic foremen are in charge of working squads.

(b) Labor foreman, in charge of labor squad, normally is assigned to cleaning and transportation of parts.

(4) *Privates*.—Automobile electrician and gas engine mechanics work on gasoline engine equipment; locomotive mechanics and railway mechanics are formed into working squads under corporal foremen; basic (laborers) report to labor foreman.

25. Machine shop platoon.—This unit repairs and assembles locomotive subassemblies such as air brake equipment, pumps, etc., performs all machine operations and machine welding on locomotive parts, and maintains, stores, and issues portable tools for the battalion. Certain machine and welding operations such as cylinder rebor-ing, frame welding, etc., are performed in the erecting shop by personnel from this platoon. It is composed of a headquarters, machine shop section, toolroom section, air brake section, and welding section.

a. *Platoon headquarters* provides administrative force to coordinate the work of the sections.

(1) First lieutenant, platoon commander, is shop superintendent. He supervises the work and sees that it is completed and delivered according to schedule. He coordinates operations of the platoon performed in the erecting shop with other erecting shop operations.

(2) Staff sergeant, assistant shop superintendent and second in command, assists superintendent in administration of the platoon.

b. *Machine shop section.*—This section performs all machine operations on manufactured parts, dismantles, repairs, and assembles locomotive subassemblies except air brake apparatus and wheel (other than driving wheel) operations, repairs and replaces woodwork and trim on locomotives, and delivers finished parts to the erecting shop or stock.

(1) Sergeant, mechanic foreman, is in charge of the section. He is responsible for distribution of work to his men and equipment, quality of work produced, and for its completion and delivery according to schedule.

(2) *Corporals*.—(a) Mechanic foremen are in charge of working squads.

(b) Labor foreman in charge of labor squad normally is assigned to the delivery of parts.

(3) *Privates*.—Carpenters operate under sergeant foreman; basic (laborers) report to labor foreman and may be assigned to other sections as required; machinists are formed into working squads under corporal foremen.

c. Toolroom section.—This section stores, maintains, and issues portable tools to all units of the battalion. It makes special tools, dies, jigs, and fixtures as required. Blacksmith operations on tools are performed by the blacksmith section of the smith shop company. Physical lay-out of shops of the battalion may make it desirable to establish separate toolrooms for issue of tools to isolated units.

(1) Sergeant, toolroom keeper, is in charge of the section and responsible for all portable tools used by the battalion. He submits requisitions for tools and tool material through company headquarters and issues tools to personnel as required.

(2) Corporal, mechanic foreman, is in charge of repair and maintenance of portable tools, and the manufacture of special tools, etc.

(3) Privates, toolmakers report to foreman mechanic, storekeepers report to toolroom keeper.

d. Air brake section.—This section cleans, repairs, and tests all car and locomotive air brake operating equipment.

(1) Sergeant, air brake mechanic, is in charge of section. He is responsible for distribution of work, and for its completion according to schedule.

(2) Corporal, air brake mechanic, is foreman in direct charge of the mechanics and test equipment.

(3) Privates, air brake mechanics.

e. Welding section.—This section performs all machine welding on locomotive parts.

(1) Sergeant, welder, is in charge of the section. He determines the practicability of welded repairs and type of welding to be employed. He is responsible for distribution of work to his personnel, and for its completion according to schedule.

(2) Privates, electric arc and oxyacetylene welders.

26. Work equipment platoon.—This platoon performs mechanical repairs on maintenance of way machinery, rail cars, wreckers, portable boilers, and other miscellaneous equipment within its capacity.

a. Platoon headquarters provides necessary administrative force for coordinating work equipment platoon with other organizations.

(1) Second lieutenant, platoon commander, is work equipment shop superintendent. He directs work of platoon and assists erecting and machine shop superintendent in coordination of mechanical work on miscellaneous and work equipment with the superintendent of the car company and the boiler and smith company, and supervises work of platoon.

(2) Staff sergeant, assistant shop superintendent and second in command, assists superintendent in administration of platoon.

b. Repair section.—This section repairs equipment.

(1) Sergeant, mechanic foreman, is in charge of the section and reports to the shop superintendent. He sees that proper materials and parts are received and put in operation in accordance with schedules and work orders provided by the shop dispatcher and approved by the platoon commander.

(2) *Corporals.*—(a) Mechanic foreman is assistant to section foreman.

(b) Labor foreman is in charge of labor squad.

(3) *Privates.*—General mechanics perform repair operations on miscellaneous equipment. Automobile mechanics and automobile electrician perform repair operations on gasoline engines, light transmissions, and related work. Welder performs welding and cutting operations as required. Basic (laborers) report to labor foreman and normally are required in transportation of parts and assisting mechanics. Additional machinists for peak loads may be drawn from the other sections of the erecting and machine company. Boiler-makers for repairs to portable boilers are not normally assigned to this section, but are drawn from the boiler and smith company as needed. Truck and body work on equipment undergoing repairs by this section is done by the car repair company either at the location of the shop section where mechanical repairs are being made or moved to the car shop after mechanical repairs are completed, as determined by car repair company commander.

SECTION V

BOILER AND SMITH SHOP COMPANY

	Paragraph
Organization	27
Function	28
Company headquarters	29
Boiler shop platoon	30
Smith shop platoon	31

27. Organization (fig. 4).—Boiler and smith shop company is composed of company headquarters, boiler shop platoon, and smith shop platoon (see T/O 5-148).

28. Function.—Boiler and smith shop company performs repair and manufacturing operations on locomotive boilers and tanks, all plate, sheet metal and structural work, forgings, springs and electrical apparatus, and pipe fitting on locomotives. It performs all bab-

bitting and brazing, forging of tools, heat-treating, and produces brass castings for the battalion.

29. Company headquarters.—This unit takes care of administration and supply of the company.

a. Captain.—See paragraph 23*a*.

b. Second lieutenant.—See paragraph 23*b*.

c. First sergeant.—See paragraph 23*c*.

d. Staff sergeant.—See paragraph 23*d*.

e. Sergeants.—(1) Mess sergeant operates the company mess and is assisted by cooks and helpers.

(2) For supply sergeant, see paragraph 23*e*(2).

(3) Storekeeper sergeant is in charge of receipt, care, and issue of such company technical supplies (except tools) as is deemed advisable to stock in boiler and smith shop area. He is also charged with

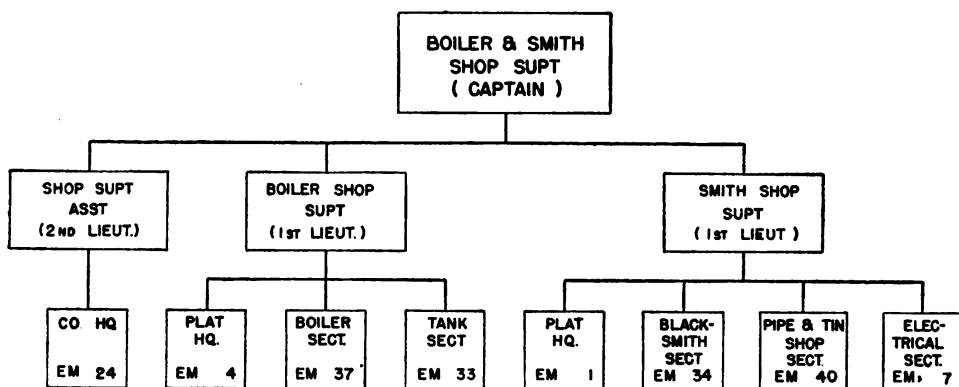


FIGURE 4.—Organization, Company B (boiler and smith shop company), railway shop battalion.

responsibility of cooperating with the battalion storekeeper sergeant, keeping him advised of the company's need for technical materials of all kinds, also where and when these materials should be delivered.

f. Corporals, clerk and storekeeper report, respectively, to first sergeant and storekeeper sergeant.

g. Privates.—Bugler is company messenger and reports to first sergeant. Cooks and helpers report to mess sergeant. Production clerks report to shop dispatcher. Chauffeurs and storekeeper report to supply sergeant, and one storekeeper reports to storekeeper sergeant. The orderly is assigned as needed.

30. Boiler shop platoon.—This unit performs all repair and manufacturing operations on boilers, tanks, and steel structural work. Operations such as cleaning and scaling, application of patches, crack welding, removal and replacement of boiler tubes, normally are performed in the erecting shop by personnel from this platoon. Re-

pairs to portable boilers such as those on maintenance of way cranes, wreckers, etc., normally are performed in the work equipment platoon of the erecting and machine shop company by personnel provided from this platoon. It is composed of headquarters, boiler section, and tank section.

a. Platoon headquarters provides administrative force to coordinate work of sections, and for inspection.

(1) First lieutenant, platoon commander, is shop superintendent. He supervises work of sections and sees that work is completed and delivered according to schedule. He adjusts normal assignment of personnel as required, and coordinates operation of platoon performed in the erecting shop with other erecting shop operations.

(2) Staff sergeant, assistant shop superintendent and second in command, assists superintendent in administration of platoon.

(3) Sergeant, boiler inspector, inspects boilers and tanks on equipment received for repair, and checks conditions with inspection reports and work orders. He inspects and passes on all boiler and tank material and repair operations, and inspects and tests boilers and tanks after completion. He submits his reports to the staff sergeant inspector in headquarters and service company, and reports defective work to his platoon commander. He is assisted by two privates, inspectors.

(4) Privates, boiler inspectors, report to sergeant inspector.

b. Boiler section.—This section performs all manufacturing and repair operations on locomotive and work equipment boilers.

(1) Sergeant, foreman mechanic, is in charge of the section. He arranges his operations in accordance with schedules and work orders prepared by shop dispatcher, and is responsible for distribution of work and proper performance of operations of section.

(2) Corporals, foremen mechanics, are in charge of working squads.

(3) *Privates.*—Boilermaker layer-out lays out plates for shearing, punching, rolling, and flanging; flangers perform all flanging operations; boilermakers perform all cleaning and scaling, application of patches, removal and replacement of boiler tubes and flues, plate rolling, fitting, reaming, riveting, and caulking, repair superheater units and tubular feed water heaters; punch and shear machine operators perform all shearing, punching, and rolling operations on plates; electric and oxyacetylene welders perform miscellaneous welding operations. Boilermakers are formed in working squads under the corporal master boilermakers, or may work under direct supervision of foreman boilermaker. Layer-out, flangers, machine opera-

tors, and welders operate under supervision of foreman boilermaker. Basic are assigned as needed.

c. Tank section.—This section performs all manufacturing and repair operations on tanks and structural steel work, and provides labor force for the platoon.

(1) Sergeant, foreman mechanic, is in charge of the section. He arranges his operations in accordance with schedules and work orders prepared by shop dispatcher, and is responsible for distribution of work and proper performance of operations of section.

(2) *Corporals.*—(a) Mechanic foremen are in charge of working squads.

(b) Labor foreman is in charge of labor squad.

(3) *Privates.*—Tank makers perform all cleaning and patching of tanks, and all manufacture and repair operations on structural steel work; punch and shear machine operators perform all shearing, punching, and rolling operations on plates and structural steel; electric and oxyacetylene welders perform miscellaneous welding operations; basic (laborers) are normally employed in handling of material and may be attached to the boiler section as required. Machine operators and welders report to sergeant foreman; tank makers are formed in working squads under corporal foremen, or may work under direct supervision of sergeant foreman; laborers report to labor foreman.

31. Smith shop platoon.—This unit performs forging, heat-treating, pipe fitting, sheet metal work, brazing, babbitting, and electrical repair work, and produces brass castings for the battalion. Operations such as fitting braces and pipe and removal and assembly of electrical apparatus and boiler jackets normally are performed in the erecting shop by personnel of this platoon. It is composed of headquarters, blacksmith section, pipe and tin shop section, and electrical section.

a. Platoon headquarters provides administrative force to coordinate work of section.

(1) *First lieutenant.*—See paragraph 30a(1).

(2) Technical sergeant, assistant shop superintendent and second in command, assists superintendent in administration of platoon.

b. Blacksmith section.—This section performs all forging, including tool forging and dressing, heat-treating and spring-making for the battalion.

(1) Staff sergeant, mechanic foreman, is in charge of section. He arranges his operations in accordance with schedules and work orders prepared by shop dispatcher, and is responsible for distribution of work and proper performance of operations of section.

(2) *Corporals*.—(a) Heavy blacksmith is in charge of heavy forging operations, normally forgings of 25 to 300 pounds, accomplished by hand tools and anvil or light power hammers.

(b) Light blacksmith is in charge of light forging operations, normally forgings up to 25 pounds, accomplished by hand tools and anvil.

(c) Steam hammer blacksmith is in charge of heavy forging operations, normally forgings of over 300 pounds, accomplished by steam hammers or forging presses.

(d) Furnaceman is in charge of operation and maintenance of furnaces for heating and melting.

(3) *Privates*.—Heavy blacksmiths are formed in two working squads, one comprising heavy blacksmith corporal foreman and helpers, and one comprising heavy blacksmith and helpers. Light blacksmiths are formed in squads, one comprising light blacksmith corporal foreman and helper, and the others each comprising one blacksmith and one helper. Steam hammer blacksmiths are formed in hammering squad in charge of steam hammer corporal blacksmith, and includes helpers and hammerman; tool blacksmiths operate independently on manufacture and dressing of forged tools; forging machine operators operate bulldozer and bolt headers for quantity production of machine bent and forged parts; heat-treaters operate furnaces, quenching and drawing tanks for heat-treatment of tools, springs, and other forgings, and report to furnaceman. Spring maker operates machinery for stripping, re-forming and assembling springs. Tool blacksmiths, spring maker, and machine operators report to blacksmith foreman. Basic are assigned as needed.

c. *Pipe and tin shop section*.—This section performs all pipe fitting on locomotives, sheet metal work, coppersmithing, brazing, babbitting, and brass molding for the battalion, and provides labor force for platoon.

(1) Sergeant, foreman mechanic, is in charge of the section. He arranges his operations in accordance with schedules and work orders prepared by shop dispatcher, and is responsible for distribution of work and proper performance of operations of section.

(2) *Corporals*.—(a) Foundry foreman is in charge of brass molding and babbitting, coppersmithing, and brazing.

(b) Pipe fitters are foremen in charge of pipe fitter squads.

(c) Sheet metal worker is foreman in charge of sheet metal workers.

(d) Labor foreman is in charge of labor squad.

(3) *Privates*.—Pipe fitters remove and assemble pipe on locomotives; coppersmiths perform soft metal fabrication, tube bending, braz-

ing, and babbitting; molders prepare molds and operate brass melting furnace; sheet metal workers fabricate and prepare all tinware and sheet metal articles, remove and replace boiler jackets; basic (laborers) may be assigned as required and report to labor foreman. Copper-smiths and molders report to brass molder foreman; pipe fitters are formed in working squads under pipe fitter foreman; sheet metal workers operate under sheet metal foreman.

d. Electrical section.—This section performs all repair work to electrical apparatus, except shop installations which are performed by the plant maintenance section of headquarters and service company, and automotive electrical repairs which are accomplished by work equipment platoon of the erecting and machine shop company.

(1) Sergeant, foreman mechanic, is in charge of the section. He arranges his operations in accordance with schedules and work orders prepared by shop dispatcher, and is responsible for distribution of work and proper performance of operations of section.

(2) Privates, electricians, remove, repair, and install generators, lights, wiring, batteries, switches and all electrical apparatus.

SECTION VI

CAR REPAIR COMPANY

	Paragraph
Organization	32
Function	33
Company headquarters	34
Freight car platoon	35
Passenger car platoon	36

32. Organization (fig. 5).—Car repair company is composed of company headquarters, freight car platoon and passenger car platoon. (See T/O 5-149.)

33. Function.—Car repair company performs heavy repairs to existing or standard military railway cars, passenger equipment, and miscellaneous work within its capacity. Repair of miscellaneous equipment involves some operations outside capacity of company equipment and personnel which are performed by other units of the battalion. Miscellaneous operations should however be confined as much as possible to the work equipment platoon of the erecting and machine shop company to avoid interference with regular operations of the battalion.

34. Company headquarters.—This unit takes care of administration and supply of the company.

a. Captain.—See paragraph 23*a*.

b. Second lieutenant.—See paragraph 23*b*.

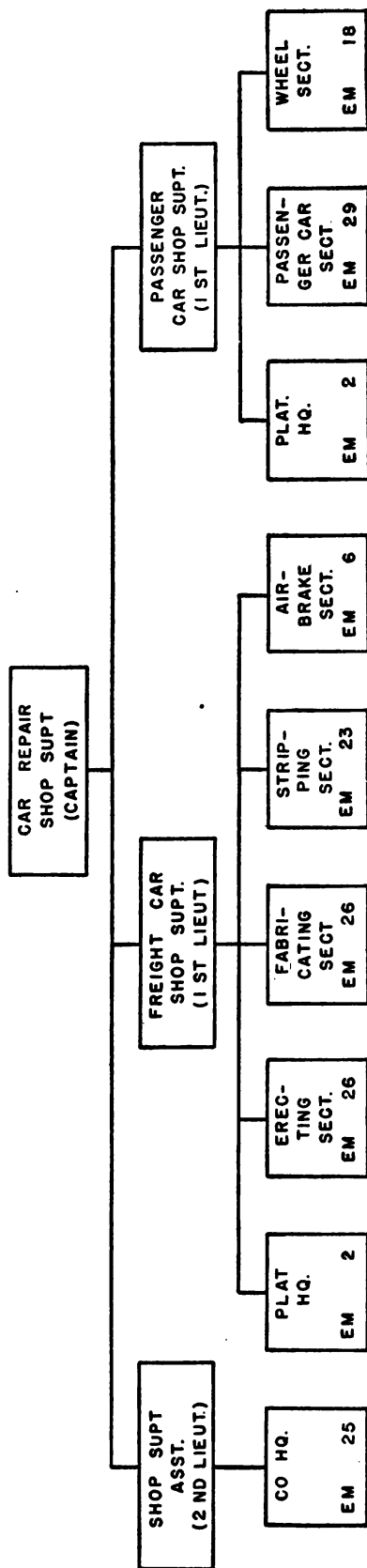


FIGURE 5.—Organization, Company C (car repair company), railway shop battalion.

c. First sergeant.—See paragraph 23*c*.

d. Staff sergeant.—See paragraph 23*d*.

e. Sergeants—(1) *Mess sergeant.*—See paragraph 29*e*(1).

(2) *Supply sergeant.*—See paragraph 29*e*(2).

(3) Storekeeper sergeant is in charge of receipt, care, and issue of such company technical supplies (except tools) as is deemed advisable to stock in car repair shop area. He is also charged with the responsibility of cooperating with the battalion storekeeper sergeant, keeping him advised of the company's needs for technical materials of all kinds, also where and when these materials should be delivered. He is assisted by a corporal, storekeeper clerk, and privates, storekeepers.

f. Corporals, clerk and storekeeper report to first sergeant and storekeeper sergeant, respectively.

g. Privates.—Bugler is company messenger and reports to first sergeant; cooks and helpers report to mess sergeant; production clerks report to shop dispatcher; chauffeurs and storekeeper report to the supply sergeant; other storekeepers report to storekeeper sergeant. Orderly and basic are assigned as needed.

35. Freight car platoon.—This unit receives standard freight cars assigned to the battalion for repair, removes and dismantles component parts, distributes these as required for repair or disposal, and reassembles the cars. Operations normally include stripping, repairing frames, applying steel framing, fitting, bolting, reaming and riveting, applying floors and wood siding and ends, applying roofs, runboards, doors, etc., applying trucks, brakes, and safety appliances. Trucks after removal should be routed on a separate stripping and assembly line. Wood floors are normally replaced; boxcar sides, ends, and roof may require whole or partial replacement; wheels and axles are removed and sent to the wheel section of the passenger car platoon; brake beams and rigging are dismantled and remanufactured; brake operating equipment is removed and rehabilitated by air brake section. Freight car stripping and assembly should be treated as a manufacturing operation and stripping and assembly lines established, the cars being turned over for painting and delivery at end of line. Painting is performed by personnel of passenger car platoon. Stripping may be accomplished outside but provisions should be made for inside stripping in inclement weather. This platoon is composed of headquarters, erecting section, fabricating section, stripping section, and air brake section.

a. Platoon headquarters provides administrative force to coordinate work of sections and for inspection.

(1) First lieutenant, platoon commander, is car shop superintendent. He has charge of stripping and assembling of freight cars received for repair, for cleaning and repair and test of car air brake operating equipment, and inspection of cars. He coordinates work of erecting, fabricating, and stripping sections and adjusts normal assignment of personnel as required.

(2) Technical sergeant, assistant car shop superintendent and second in command, is general foreman in charge of work of platoon.

(3) Sergeant, car inspector, inspects and passes on all materials and parts received for assembly, and inspects cars during assembly. He reports to the platoon commander.

b. Erecting section.—This section operates a freight car assembly line and assembles cars from parts or subassemblies received from stock or from other units of the battalion.

(1) Sergeant, car shop foreman, is in charge of the section. He is responsible for the proper assembly of cars. He sees that the proper materials and parts are received, arranges operations, and distributes personnel for maximum production and in accordance with schedules and work orders prepared by shop dispatcher.

(2) *Corporals.*—(a) Assistant car builders, shop foremen, are in charge of working squads.

(b) Labor foreman is in charge of labor squad.

(3) *Privates.*—Car mechanics perform all assembly operations, except air brake operating equipment and piping, and are formed in working squads under corporal foremen; basic (laborers) normally are employed in placing material and assisting mechanics, and report to labor foreman.

c. Fabricating section.—This section normally is employed in production of subassemblies from parts received from stock or other units of the battalion. It has the same personnel as the erecting section.

d. Stripping section.—This section strips cars for repairs.

(1) Sergeant, car shop foreman, is in charge of the section. He receives cars for repair and is responsible for their dismantling and delivery of parts to other units in accordance with schedules and work orders prepared by shop dispatcher.

(2) *Corporals.*—(a) Assistant car builder, shop foreman, is in charge of working squads.

(b) Labor foreman is in charge of labor squad.

(3) *Privates.*—Car mechanics perform all stripping operations and are formed in squads under corporal foremen. An oxyacetylene

welder normally is attached to each mechanic squad and is employed on cutting rivets, bolts, and other parts uneconomical to remove intact. Basic and mechanic helpers normally are employed in cleaning and transportation of parts and assisting car mechanics; laborers report to labor foreman.

e. Air brake section.—This section removes all car air brake operating equipment, makes necessary repairs and tests, and reassembles such equipment and piping on cars.

(1) Sergeant, air brake mechanic, is in charge of section. He is responsible for distribution of work and for its completion according to schedule. He coordinates assembly of air brake equipment on cars with other operations on assembly line.

(2) *Private*, air brake mechanics, and pipe fitters.

36. Passenger car platoon.—This unit repairs passenger cars. It performs all miscellaneous work, operates car wheel and axle shop, and performs all necessary dismantling, repair and assembly operations on such work within its capacity, including body and truck repair of cranes, rail cars, etc. It performs all painting on cars and miscellaneous equipment. While separate paint shops for freight and passenger cars normally are used commercially, this is not necessary in military operations as the same grade work will be used on all types of equipment. Old paint is sandblasted from steel and scraped from wood outside the paint shop, and the cars immediately moved to the shop for first coat. Paint normally is sprayed on exteriors and lettering applied with stencils. Storage space for paint should be provided in a separate building. The platoon is composed of headquarters, passenger car section, and wheel section.

a. Platoon headquarters provides the administrative force to coordinate work of sections.

(1) First lieutenant, platoon commander, is shop superintendent. He has charge of the repair of passenger cars, car wheel and axle work, and miscellaneous work assigned to the platoon. He arranges for performance of operations beyond the capacity of the platoon with other units of the battalion. He coordinates operations of sections and adjusts normal assignment of personnel as required.

(2) Staff sergeant, assistant shop superintendent and second in command, assists superintendent in administration of platoon.

b. Passenger car section.—This section repairs standard railway passenger cars, hospital cars, and similar equipment, performs all painting on cars and miscellaneous equipment, pattern making, wood-working, upholstery, and canvas work.

(1) Sergeant, car shop foreman, is in charge of the section. He sees that proper materials and parts are received, and arranges his operations in accordance with schedules and work orders prepared by shop dispatcher.

(2) *Corporals*.—(a) Carpenter is in charge of woodworking, pattern making, and upholstery operations.

(b) Electrician is in charge of repair of electrical apparatus on railway cars.

(c) Painter is in charge of painting cars and miscellaneous equipment.

(d) Labor foreman is in charge of labor squad.

(3) *Privates*.—Electricians remove and replace storage batteries and other electrical equipment; cabinetmakers and carpenters repair and refit woodwork on passenger equipment; machine woodworkers produce lumber for car decking, sheathing, etc.; pattern maker produces patterns for castings and other woodwork as required; upholsterers repair upholstery in passenger and work equipment and produce curtains, covers, and other canvas work; general painters and sign painter spray-paint car exteriors, brush-paint interiors, and stencil; basic (laborers) are employed on cleaning, sandblasting, and moving materials. Cabinetmakers, carpenters, woodworking machine operators, pattern maker, and upholsterers report to carpenter foreman; electricians report to electrician foreman; painters report to paint foreman; laborers report to labor foreman.

c. *Wheel section*.—This section performs machine operations on wheels and axles (other than locomotive driving wheels and axles). It has the necessary personnel and is equipped to perform these operations on all such equipment on a railway grand division and to supply the grand division with replacement units.

(1) Sergeant, foreman mechanic, is in charge of the section. He sees that proper materials and parts are received and arranges his operations in accordance with schedules and work orders prepared by shop dispatcher.

(2) Corporals, mechanic foremen, wheel checkers, assist sergeant foreman mechanic.

(3) *Privates*.—Boring mill operators turn and bore car wheels; lathe operators turn car axles; railway mechanics remove and assemble car wheels and axles; basic laborers are employed in handling wheels and axles in transportation platoon.

SECTION VII

DRILL AND CEREMONIES

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Rules relating to men armed with pistols.....	40
Drill organization.....	41
Close-order drill.....	42
Formations.....	43
Inspection.....	44
Ceremonies.....	45
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37. General.—*a.* Units of the railway shop battalion are organized for work and not for drill and combat. The company as a unit does not in general engage in prescribed drills. Such drill as is conducted is normally executed by the platoon. It practices close-order drill to the extent necessary to prepare for participation in ceremonies and marches.

b. Organization of companies of the battalion as given in Tables of Organization shows personnel as grouped while engaged upon shop work. This organization is suitable for drill or ceremonies. To take care of military training, drill and assembly formations for companies are herein prescribed (see fig. 6).

c. Companies are assembled and inspected in these formations.

d. Noncommissioned officers are assigned to duty as platoon leaders, platoon sergeants, platoon guides, squad leaders, second in command of squad.

e. Fundamentals of drill, ceremonies, and inspections prescribed in FM 22-5 for the infantry rifle company and infantry battalion are applicable to units of the railway shop battalion, with such changes as are specified herein or are required due to difference of organization or arm.

38. Battalion staff.—*a.* The battalion commander's staff for ceremonies consists of second in command, adjutant, and battalion surgeon.

b. Enlisted personnel of the battalion commander's staff consist of the sergeant major and one private from headquarters and service company.

c. Arrangement of members of the battalion staff is in accordance with provisions of FM 22-5.

39. Color guard and guidon.—*a. Color guard.*—(1) Regulations covering color guard are contained in FM 22-5.

RAILWAY SHOP BATTALION

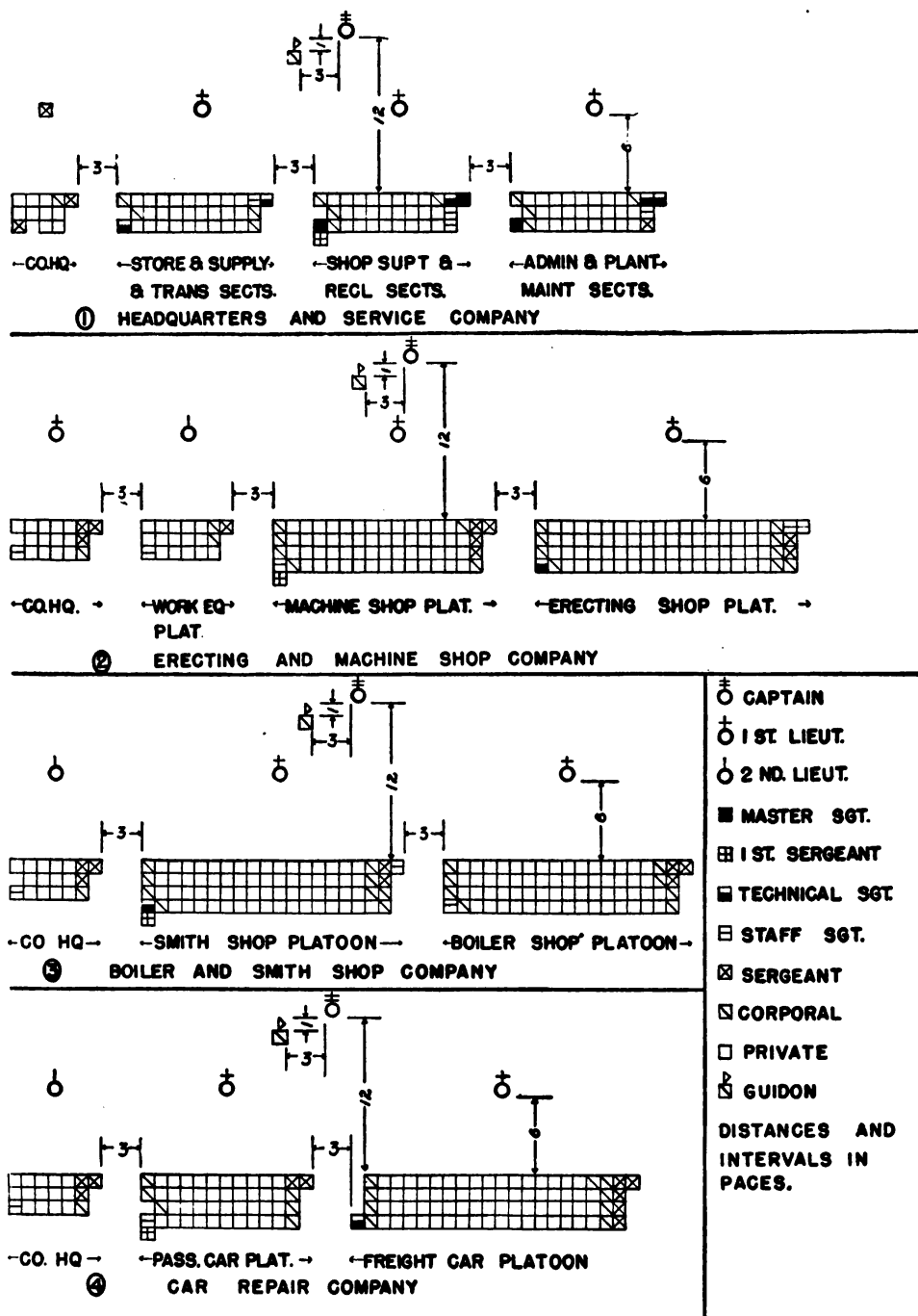


FIGURE 6.—Drill and assembly formations, railway shop battalion.

(2) Erecting and machine shop company of the battalion is the color company.

(3) The color is received by the color company as described in FM 22-5 with the exception that the hand salute is executed instead of present arms.

b. Guidon.—(1) The guidon is carried according to regulations prescribed in FM 22-5. The company clerk normally carries the guidon.

(2) Position of the guidon in various company formations is shown in figure 6.

40. Rules relating to men armed with pistols.—Officers and enlisted men are armed with the pistol or revolver. At the ceremonies described in chapter 9, FM 22-5, presentation of an organization to its commander at retreat and guard mounting, officers and enlisted men execute the hand salute at the following commands: 1. BY THE NUMBERS, 2. HAND, 3. SALUTE, 4. TWO.

41. Drill organization.—*a. Platoon.*—(1) The drill platoon is composed of a platoon headquarters and two or more squads.

(2) Platoon command group comprises platoon commander, platoon sergeant (second in command), and three runners. For the purpose of drill or ceremonies the runners may be used to fill out squads.

(3) The platoon commander may be an officer or noncommissioned officer.

b. Company.—The company is composed of company headquarters and two or more platoons. Company command group consists of company commander, one other officer (if available), first sergeant, and guidon. For purposes of drill or ceremonies personnel of company headquarters may be attached to platoons to fill out squads, or form an extra squad.

c. Battalion.—The battalion is composed of three companies and headquarters and service company. Units of the battalion are arranged in the following order from front to rear or from right to left: headquarters and service company, erecting and machine shop company, boiler and smith shop company, car repair shop company and medical detachment.

42. Close-order drill.—*a. Soldier.*—All personnel of the battalion receive the individual instruction of a soldier dismounted without arms and that of a soldier dismounted with pistol as given in FM 22-5.

b. Squad.—Squad drill is carried out as laid down for the infantry rifle squad in FM 22-5.

c. Drill platoon.—The platoon is drilled as an infantry rifle platoon (see FM 22-5), and is the largest unit engaged regularly in drill. For-

mations of the platoon are similar to those of the infantry rifle platoon and include line and column of twos, threes, or fours.

d. Company.—The company drills as an infantry rifle company. The purpose of close-order drill of the company is to permit it to participate in ceremonies (see FM 22-5). Formations include line, column of platoons, and mass.

e. Battalion.—The battalion does not engage in close-order drill.

43. Formations.—*a. General.*—Formations employed are—

(1) *Drill and assembly*, used for reveille, retreat, roll call, inspection, and drill. It is used habitually on company parade and normally precedes formation for drill or ceremonies.

(2) *Route march*, used on the road.

(3) *Inspection*, used for careful check of personnel, for detailed inspection of personnel, equipment, and motor transport.

b. Drill and assembly.—Elements of the company are arranged from right to left as shown in figure 6. The various elements form under their leaders. Company headquarters is always on the left. To form the company, see paragraph 14a, FM 22-5.

c. Route march.—(1) For route march the companies take up the march formation shown in figure 35, FM 22-5. Chauffeurs for the company trucks, mess sergeant, supply sergeant, and cooks and helpers join the company or battalion vehicles. When the company acts alone it calls upon the headquarters and service company for an additional truck and one motorcycle with chauffeurs. When the entire battalion takes up the march, the company truck and mess sergeant, supply sergeant, and cooks and helpers join the headquarters and service company. The transport section of the headquarters and service company increased by company trucks is placed under command of an officer designated by the company commander. Individuals of companies designated above with such additional personnel as may be designated by proper authority are assigned to vehicles by the transport section commander.

(2) The march is governed by the regulations applicable to the infantry rifle company and the infantry battalion with such modifications as are necessary due to difference in organization.

(3) Order of march of the battalion is prescribed by the battalion commander.

44. Inspection.—*a. Types.*—The two types of inspection are—

(1) *Military*, made for the purpose of determining condition of personnel, individual equipment, quarters and arms of the organization, and carried on in accordance with provisions of section IV, chapter 9, FM 22-5.

(2) *Technical*, made for the purpose of improving efficiency of the unit and the individual on shop work and to insure safe operation. It includes inspection of facilities, of technical qualifications of individuals, of work, and of equipment and material other than individual.

b. When made.—(1) When personnel are not engaged upon shop work, inspections normally are held in the company area. The company is usually formed for inspection in work groups under group commanders as shown in figure 6.

(2) When personnel of the battalion are engaged upon shop work, military inspection is not made at a time or in a way which interferes with its operations. When made, the formation is prescribed by the local commander, following the general principle that personnel are placed under work leader and that groups engaged upon different types of work are separated.

(3) Technical inspections are made continuously by unit commanders to maintain efficiency of their organizations on work. Methods of making technical inspection are prescribed by the battalion commander in such a way as not to interfere with essential work.

45. Ceremonies.—*a.* Rules governing participation of the battalion in ceremonies are prescribed in FM 22-5.

b. Relative positions of the several units of the battalion are prescribed in paragraph 41*c*.

c. Organizations habitually pass in review in company mass formation or columns of threes or fours.

46. Extended order.—The battalion does not receive training in extended order.

SECTION VIII

TRAINING

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47. General.—*a.* The battalion must undertake disciplinary physical, and technical training (see FM 5-5).

b. The purpose of disciplinary training is to develop the habit of obedience, to permit participation in ceremonies and inspections, to promote teamwork and morale within the organization, and to develop leadership.

c. The purpose of physical training is to develop the bodies of individuals so as to enable the organization to accomplish the arduous tasks which it is required to perform in the theater of operations without unduly depleting its strength by sickness. Physical training is included in training programs by unit commanders and includes games and calisthenics (see FM 21-20 (now published as ch. 4, BFM, vol. I)).

d. Technical training is all training undertaken for the purpose of qualifying individuals and units in performance of duties relating to shop operations. Efficient operation of a repair shop of the size and under the conditions contemplated requires a large quantity of technical data such as plans of equipment to be repaired, descriptions of shop machinery and equipment which will be available, and of typical shop lay-outs, studies of work operations, etc., collection and study of which will form the major part of technical training of officers and most noncommissioned officers.

48. Private.—The individual soldier must be trained—

a. In military courtesy and discipline, including basic training of the soldier, guard duty, first-aid, and hygiene.

b. To use weapon with which armed.

c. To perform duties to which assigned.

d. To execute movements of close order.

49. Noncommissioned officer.—*a.* In addition to training prescribed for the private, the noncommissioned officer is trained in command.

b. Operations of the railway shop battalion comprise innumerable small operations by individual workmen, proper execution of which can only be supervised by leaders of small groups. In training noncommissioned officers emphasis must be placed on the sense of responsibility for proper execution of work, initiative and leadership to relieve officers of minor details of operation.

50. Commissioned officer.—A unit commander must be trained—

a. In relation between his unit and other units of the battalion.

b. In powers and limitations of unit he commands.

c. In means and methods employed in execution of work.

d. To utilize existing subordinate units under their leaders for execution of work.

e. To supervise work, that is, see that tasks are properly carried out, that correct methods are used, and that supply of materials is maintained.

f. To plan for improvement of activity over which he exercises control.

51. Unit.—A unit must be trained in—

a. Railway shop work, to execute rapidly and systematically work which may be assigned to it.

b. Close-order drill to the extent applicable to it.

52. Method.—*a.* The method adopted should aim to create an organization capable of operating under varying conditions with maximum speed and efficiency. To attain this end, emphasis must be placed upon disciplinary and command training, that is, training groups under their leaders.

b. In order to create a smooth-running organization, individuals therein must be soldiers and engineers, and they must be trained to operate as a unit or group.

c. When the unit is not employed on technical work, that is, during mobilization or in rest camps, training is concentrated on—

(1) Military training; duties of the soldier; drill, ceremonies, inspections, and marksmanship.

(2) Care and use of tools assigned to the unit.

d. When the unit is employed on shop work, training emphasis is placed upon development of specialists qualified to perform work and operate machines of the unit. This type of training is continuous and is carried on by the apprentice system used in commercial shops. This training should not interfere with technical operations of units.

e. In general, individual training should be conducted by noncommissioned officers. In order to train instructors and certain specialists, schools may be conducted within the battalion. Officers prepare training programs, supervise their execution, and train instructors and certain specialists.

SECTION IX

MEDICAL DETACHMENT

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53. General.—*a.* The medical detachment must be able to furnish adequate medical aid whether the battalion is operating a railway repair shop or in a mobilization camp. The detachment must take care of the usual sickness and shop accidents.

b. The battalion commander designates location of the battalion dispensary and first-aid stations upon recommendation of the battalion surgeon.

54. Drill and ceremonies.—The detachment is handled in accordance with the regulations prescribed in manuals for regimental medical detachments with such modifications as may be necessary due to difference in strength, organization, and employment.

[A. G. 062.11 (7-29-40).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
Major General,
The Adjutant General.

